

## Graham North, BSc, BEng

### Contact Information:

- **Mobile:** +44 (0)779 321 1967
  - **Email:** cvreply@netlinux.co.uk
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### Summary:

Experienced Embedded Real-Time Engineer and Architect with over 20 years in the field, specializing in AI/ML applications for embedded systems. Proficient in integrating Neural Processing Units (NPU), optimizing AI/ML models for resource-constrained environments, and implementing real-time edge AI solutions. Skilled in various operating systems, software, and hardware platforms, with a proven track record in leading teams and managing complex projects focused on cybersecurity, real-time systems, and compliance with industry standards.

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### Technical Skills:

- **Operating Systems:** Linux (Yocto, Ubuntu, RedHat, SuSE), RTOS (PikeOS, FreeRTOS, Zephyr), Unix (AIX, Solaris), Embedded Linux, Windows (Server, Desktop).
  - **Software:** C/C++, Python, Java, Bash, Embedded Systems, Linux Kernel Development, Driver Development, TensorFlow Lite, OpenEmbedded (OE), Yocto Project, Docker, Kubernetes, Git, Machine Learning Model Optimization, Secure Boot Development.
  - **Hardware:** ARM (Cortex-A, Cortex-M, Cortex-R), NXP i.MX Series (i.MX 6, i.MX 8M Plus), NVIDIA Jetson, Intel (Core/Xeon), FPGA (Xilinx, Altera), JTAG, MRAM, PIC (16FXXX), Neural Processing Units (NPU), Data Processing Units (DPU), Raspberry Pi, Edge AI Accelerators.
  - **Management:** Team leadership, agile project management, task allocation, performance assessment, recruitment, cross-functional team collaboration, and resource planning.
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### Professional Experience:

#### AI Kernel/Embedded Engineer | Linaro

##### July 2024 - current

- Developed a bootloader and Linux kernel with Execute-In-Place (XIP) to optimize size and boot speed, integrating AI capabilities on ARM Cortex-A SoC architecture.
- Customized u-boot and kernel for minimal ROM/RAM usage, utilizing ARM Trust Firmware for secure boot and supporting AI/ML model execution in resource-constrained environments.
- Created tailored OpenEmbedded recipes within Yocto-based Linux, assembling a minimal Linux environment optimized for embedded AI applications.
- Conducted simulator-based testing and debugging using RTL pre-silicon simulators, validating AI functionality and system performance before hardware deployment.
- Enabled XIP for u-boot and Linux kernel with NOR/MRAM, allowing efficient AI model execution on embedded hardware and ensuring seamless integration across system components for a secure, AI-ready solution.

## **MoD SC Cleared Senior Embedded Real-Time AI Engineer/Architect | MBDA**

### **December 2023 - July 2024**

- Developed embedded software for missile guidance systems using Embedded C, integrating with Texas Instruments SoCs and NXP i.MX 6 processors for real-time performance.
- Utilized PikeOS RTOS to implement a secure separation microkernel architecture, meeting stringent safety and security standards in defense applications.
- Implemented ARM TrustZone technology on NXP i.MX 6 platforms, enhancing cybersecurity protection for critical software components in mission-critical environments.
- Conducted a research project on the NXP i.MX 8M Plus processor, focusing on its Neural Processing Unit (NPU) for AI/ML applications, including computer vision and Industry 4.0 use cases.
- Adhered to MISRA C guidelines, DO-178, and IEC 61508 safety standards, ensuring compliance and reliability in safety-critical software development.
- Collaborated with hardware teams for seamless SoC integration and used IBM Rational Team Concert for effective project management.

## **Principle Embedded Real-Time Engineer/Architect | Turbo Electric**

### **October 2018 - Present**

- Led the development of EV charging systems with a focus on AI-driven V2G technology.
- Ensured compliance with IEC 61508 and ISO 26262 standards.
- Integrated AI and machine learning models to enhance system efficiency.

## **Linux Real-Time System Engineer/Architect | Campus Society/Connectt**

### **July 2018 - October 2018**

- Transitioned the platform from a monolithic architecture to a microservices-based cloud architecture.
- Implemented continuous deployment strategies using Terraform and BASH scripting.

## **Linux System Engineer/Architect | QuintilesIMS**

### **May 2017 - March 2018**

- Automated software deployment processes, increasing platform stability.
- Provided continuous support and project management using Jira and Confluence.

## **Linux Technical Engineer/Architect | Secret Escapes**

### **February 2017 - April 2017**

- Automated build/test processes and optimized storage infrastructure.
- Addressed platform issues to enhance system performance and reliability.

## **Real-Time Technical Engineer/Architect | Home Office**

### **May 2016 - November 2016**

- Integrated legacy platforms into new deployment environments.
- Developed network monitoring tools and managed workflow using Scrum/SAFe methodologies.

## **Real-Time Platform Engineer/Network Architect | CenturyLink**

**February 2013 - January 2016**

- Designed real-time monitoring platforms and provided customer-facing technical support.
  - Managed a team to optimize real-time applications and increase system efficiency.
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### **Education:**

- **BSc in Computer Science** - Lancaster University  
**1995 - 1998**
  - **BEng in Electronic/Mechanical Engineering** - University of Central Lancashire  
**1990 - 1993**
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### **Certifications:**

- MoD SC Cleared